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VASCULAR DISEASE

IMPROVED LIMB PERFUSION AND NEOVASCULOGENESIS MEDIATED BY INTRAMUSCULAR INFUSION OF LIN-/SCA1+ PROGENITOR CELLS

ACC Poster Contributions
Ernest N. Morial Convention Center, Hall F
Sunday, April 03, 2011, 3:30 p.m.-4:45 p.m.

Session Title: Lower Extremity Peripheral Arterial Disease
Abstract Category: 11. Peripheral Arterial/Carotid Disease/Aortic Disease
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Background: Bone marrow derived progenitor cells have been suggested to promote postnatal neovascularization, therefore providing a potential therapeutic option for ischemic diseases. In this study we investigated whether direct intramuscular infusion of enriched hematopoietic cells, improved limb perfusion in a murine model of hind limb ischemia.

Methods: Wild type C57BL/6 male mice underwent unilateral hind-limb ischemia, were divided in three groups (n=12/group) and received a single intramuscular injection of 1x106 Lin-/sca+ cells, or granulocyte colony-stimulating factor (G-CSF) for 7 days or normal saline. Each group Mice underwent laser Doppler perfusion imaging after surgery on days 0, 7 and 28 for the estimation of the bilateral hind-limb perfusion. Muscle tissue sections were stained with rat anti-CD31antibody. Capillaries and arterioles in the ischemic areas were counted with confocal microscopy at day 28.

Results: Ischemic/non ischemic ratio was significantly increased in ischemic limbs of cell- and G-CSF-treated mice versus control mice at 7 days ($p<0.05$ vs control), which was maintained at 28 days ($p<0.05$ vs control) only in the cell-treated group. There was no significant increase of ischemic/nonischemic ratio in the cell-treated mice compared with G-CSF at day 7 or day 28 (p=NS). Capillary density was increased in the cell-treated group compared to G-CSF-treated group and control (2.67±0.44 vs 1.6±0.39 vs 0.71±0.59 cap/cm2 $p<0.05$). No difference in the capillary density between the G-CSF-treated and the control group was observed.

Conclusion: Direct intramuscular infusion of lin-/sca+ significantly improved blood flow and vasculogenesis compared with G-CSF and saline treatment. Direct intramuscular infusion of bone marrow derived or endothelial progenitor cells but not cell mobilization with G-CSF increased blood flow and vasculogenesis in a murine model of limb ischemia.